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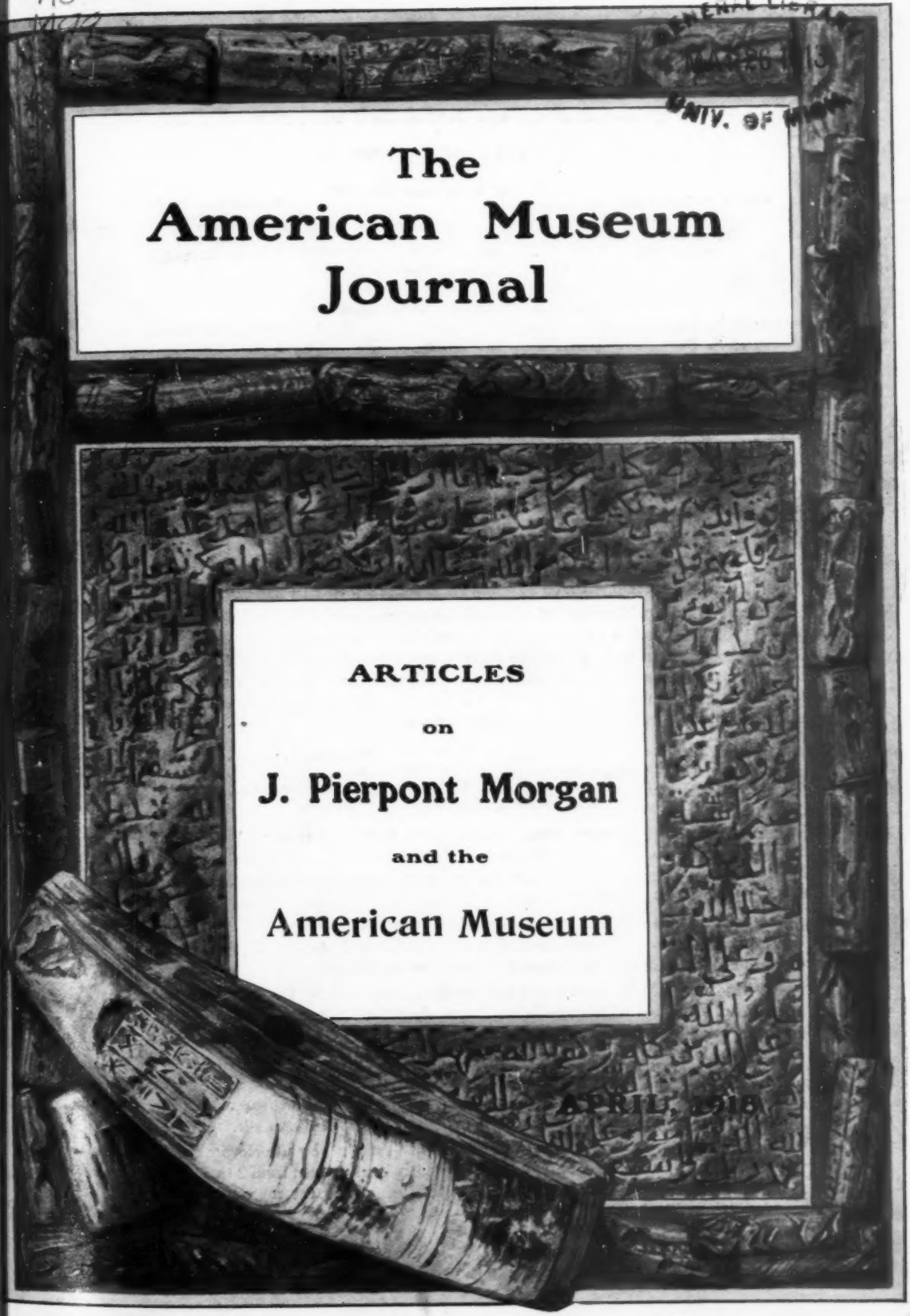
The American Museum Journal



ARTICLES

on

J. Pierpont Morgan

and the

American Museum

APRIL, 1918

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American Museum of Natural History

Seventy-seventh Street and Central Park West, New York City

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The Museum is open free to the public on every day in the year.

The American Museum of Natural History was established in 1869 to promote the Natural Sciences and to diffuse a general knowledge of them among the people, and it is in cordial coöperation with all similar institutions throughout the world. The Museum authorities are dependent upon private subscriptions and the dues from members for procuring needed additions to the collections and for carrying on explorations in America and other parts of the world. The membership fees are,

Annual Members	$ 10	Fellows	$ 500
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The Museum Publications are issued in six series: *Memoirs*, *Bulletin*, *Anthropological Papers*, *American Museum Journal*, *Guide Leaflets* and *Annual Report*. Information concerning their sale may be obtained at the Museum library.

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Workrooms and Storage Collections may be visited by persons presenting membership tickets. The storage collections are open to all persons desiring to examine specimens for special study. Applications should be made at the information desk.

The Mitla Restaurant in the east basement is reached by the elevator and is open from 12 to 5 on all days except Sundays. Afternoon Tea is served from 2 to 5. The Mitla room is of unusual interest as an exhibition hall being an exact reproduction of temple ruins at Mitla, Mexico.

The American Museum Journal

VOLUME XIII APRIL, 1913 NUMBER 4

CONTENTS

Cover, Design from Objects in the Morgan Gem Collection
[See note page 200] Drawn by Mr. S. Shimotori

Frontispiece, J. Pierpont Morgan, Recent Photograph

J. Pierpont Morgan — A Founder and Benefactor of the Museum
JOSEPH H. CHOATE 155

The Gifts of Mr. Morgan to the American Museum
HENRY FAIRFIELD OSBORN 157
With an expression of gratitude and indebtedness by the Board of Trustees

The Morgan Collection of Precious Stones
GEORGE FREDERICK KUNZ 159
History of the assembling of the Morgan gem collection and some description of its contents

A Treasure House of Gems ..... L. P. GRATACAP 169
An appreciation of the beauty of the Morgan collection

The Work of Carl E. Akeley 173
Illustrations from models of elephant groups and single figures to be cast in bronze
Brief suggestions as to the plans for the new African hall

Personnel of the Crocker Land Expedition ..... EDMUND OTIS HOVEY 179
Mr. Donald B. MacMillan, leader; Mr. W. Elmer Ekblaw in charge of geological and botanical work; Ensign Fitzhugh Green, U. S. N., meteorology, map-making, earthquake records, wireless telegraphy. Mr. Maurice C. Tanquary, zoölogist

Bird Studies in the Andes 183
With portrait of Mr. Frank M. Chapman and quotations from his letters

The Albatrosses of Laysan ..... HOMER R. DILL 185
Illustrations from photographs by the Author

Opening of the Hall of Public Health 193
Report by the department with descriptions of the enlarged model of the house fly constructed during the past year by Mr. Ignaz Matausch
Quotations from addresses by Prof. Henry Fairfield Osborn and Dr. C–E. A. Winslow, given on the evening of the opening at a public meeting in the interest of the campaign for civic cleanliness instituted by the New York City Department of Health

Museum Notes 198

MARY CYNTHIA DICKERSON, *Editor*

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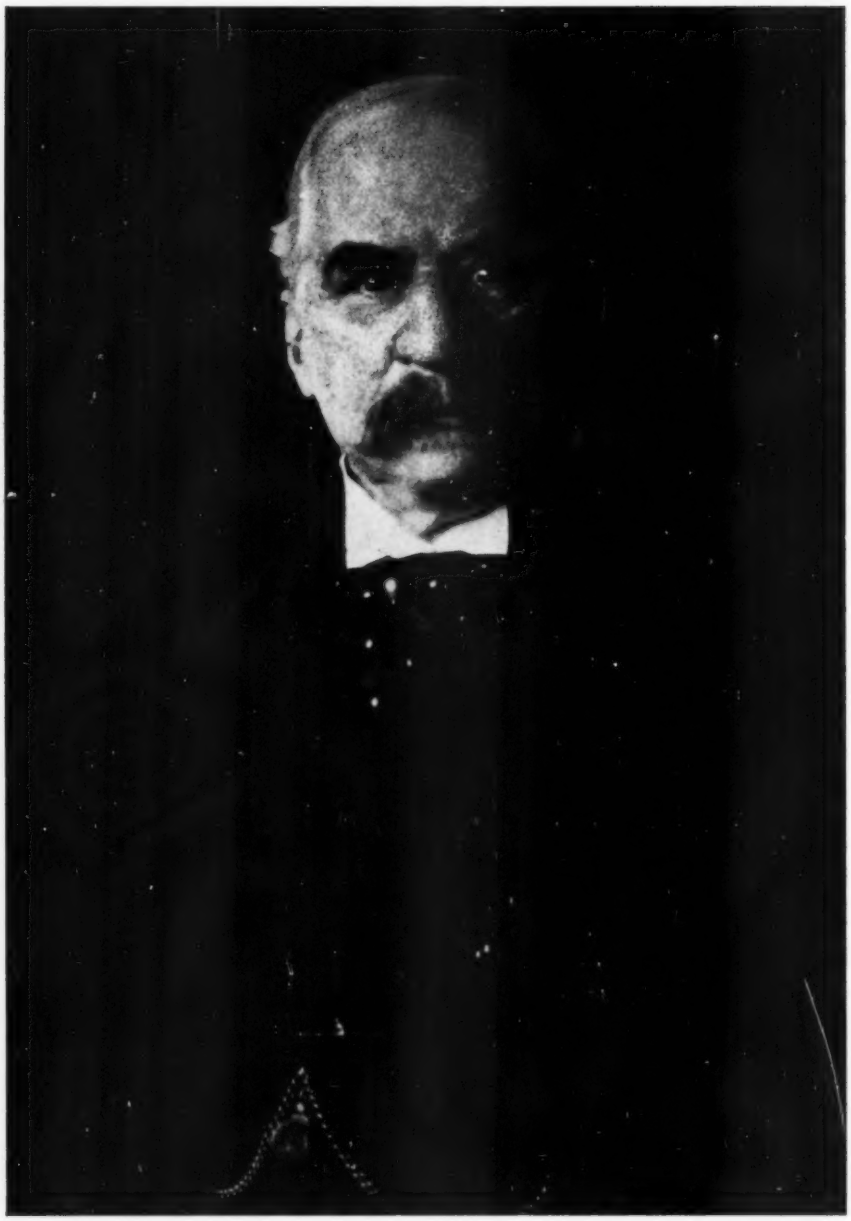


J. PIERPONT MORGAN

1837–1913

One of the founders of the American Museum of Natural History. Member of the finance committee of the Board of Trustees, 1873–1910. Treasurer, 1875–1890. First vice-president, 1903–1910. Mr. Morgan was also one of the institution's most generous benefactors

The American Museum Journal

Vol. XIII APRIL, 1913 No. 4

J. PIERPONT MORGAN

A FOUNDER AND BENEFACTOR OF THE MUSEUM

By Joseph H. Choate

THE death of J. Pierpont Morgan is a very severe loss to the American Museum of Natural History. As one of the charter founders of the Museum, as a trustee from the beginning, and for a long period a vice-president and a member of the Executive Committee, he exercised always a commanding influence in its councils, and as one of its most generous benefactors, he contributed largely to the enrichment of its collections.

To the long continued efforts of Morris K. Jesup and of Henry Fairfield Osborn to maintain the Museum in a leading place among the museums of natural history in the world, and at the same time to make it a powerful educational influence in the City of New York, he gave continual support. The very rich and almost unique collection of gems and minerals which he presented to the Museum is in itself an object of vast interest and admiration in the scientific world, as well as in the popular mind, and is a delightful monument to his memory. And then, besides the material wealth which he has donated so freely to the Museum, the mere fact of his having been a member of its Board of Trustees and an active worker in its affairs for more than forty years, is an invaluable possession.

As Mr. Morgan himself said in his examination at Washington, "character is the secret of all success in life," and this applies as well to corporate as to individual success, and especially to corporations organized not for money-making or business purposes, but for the promotion, in any form, of the public welfare; and when an institution like the American Museum of Natural History aspires, as it did from the beginning, to take a great place not only in the public eye but also in the scientific and educational world, the presence of such an individual in its government invites and holds for it at all times universal approval. It was sufficient to say that Mr. Morgan was one of its active officers and workers to answer all queries about it.

To his associates in the Board, and to the scientific staff and large company of employees, who regarded a visit of his to the Museum as an important event, he had long since become a figure of great personal interest which commanded their general respect and affection. His influence was always for good, and for conduct and measures on the part of the Museum, of an elevated and inspiring character. The same qualities that gave him his supreme place among his fellow citizens in the United States and attracted the admiration of all the people in the world who knew him, if even only by name, made him always an invaluable element in the cause of education and science represented by the American Museum.

By courtesy of the Century Club

J. PIERPONT MORGAN

Photograph taken at about the time of the founding of the American Museum

THE GIFTS OF MR. MORGAN TO THE AMERICAN MUSEUM

WITH AN EXPRESSION OF GRATITUDE AND INDEBTEDNESS BY THE BOARD OF TRUSTEES

By Henry Fairfield Osborn

AT the age of thirty-one J. Pierpont Morgan had won such a position in New York that as one of the leading citizens of the city he was included among the founders of the American Museum. From the first he took an active part, joining Joseph H. Choate and Andrew H. Green in preparing the laws of the institution and William T. Blodgett and Theodore Roosevelt in securing legislation to provide for the erection of a building. After rendering these initial services, as early as 1871 he united with Morris K. Jesup and others to mature plans to increase the funds of the Museum; he served as a member of the finance committee from 1873 to 1910, as treasurer from 1875 to 1890, and as first vice-president from 1903 until 1910. He was the chief supporter of Mr. Jesup's great administration, and was second only to Mr. Jesup as the most generous benefactor of the Museum. His interest was not centered in any one department, but extended to the Museum as a whole, as manifested by his munificent contributions of $25,000 to the endowment in 1890 and of $300,000 in 1904.

The trustees of the Museum desiring to express the gratitude of the institution for this noble life work, adopted the following resolution at a special meeting of the board on April 4:

> The people of New York and of this country are forever indebted to
>
> **John Pierpont Morgan**
>
> for his large share in the foundation and the upbuilding of
>
> **The American Museum of Natural History**
>
> as a national institution of education and of public welfare.
>
> From December 30, 1868, when the first steps were taken to found the Museum, until 1912, when he last visited his collections of minerals and gems in the Museum, he gave munificently of his time, his judgment, his affection, his means. In this, as in so many other public causes, he will be remembered as a true patriot and loyal citizen of the republic.
>
> He served as charter member of the museum corporation, as treasurer, as chairman of the Finance Committee, as first vice-president. His gifts to the exhibition halls and to the endowment have enriched every branch of the Museum, and are of such a rare and beautiful character as to give an inspiration and love of nature for all time.

His love of the beautiful led Mr. Morgan to take special interest in the collections of minerals and gems. It is probable that he himself kept no record of the whole number of his gifts, for he gave out of love for the institution and the pleasure of giving. It is interesting therefore, to enumerate for the first time some of his chief donations which have been brought together in the long record of forty-four years since the Museum was founded:

Collection of gems and precious stones
Bement collection of minerals
Bement collection of meteorites
The John Collins Warren collection, including the Warren Mastodon
Charles R. Knight's restorations of fossil vertebrates
Lenders collection of Indian costumes
Contribution to the third African expedition
Garces archæological collection from Lake Titicaca
Contributions to the endowment
Contributions to the capital and maintenance fund
Mummy of the Chilean miner
Great boulder of jade from New Zealand

It was through Mr. Morgan that the Museum came into possession of the unique series of restorations of extinct animals executed by Charles R. Knight, reproductions of which have found their way into most of the natural history museums of the Old World.

The Garces collection received from him comes from prehistoric sites on the islands of Lake Titicaca, Peru, and Copacabana, Bolivia, numbering about five hundred objects in gold, silver, copper and bronze, of beautiful design.

The Lenders Plains Indian collection numbers more than twelve hundred pieces and contains many old and rare examples of Indian costumes, beads and quill work, shields, ornamented pipes and weapons.

One of his most unique gifts is that of the ancient pre-Columbian miner, known as the Chilean mummy, wonderfully preserved through the tissues being impregnated with copper salts.

On the occasion of his last visit to the Museum Mr. Morgan was delighted with the rearrangement of the mineral collection in the great south hall, and his very last gift to the Museum, a few months before his death, was an especially exquisite collection of precious and semiprecious stones.

It seems appropriate to the committee of the trustees appointed to memorialize the great services of Mr. Morgan to the Museum to place an artistic memorial of the donor in the halls which will always be especially associated with his name, and to perpetuate his memory still further by naming these halls "the Morgan Halls."

THE MORGAN COLLECTION OF PRECIOUS STONES

By George Frederick Kunz

OF all the many and munificent gifts with which our great and lamented fellow citizen, John Pierpont Morgan, enriched the collections of our museums, none has afforded more instruction to a large number of visitors or is more highly appreciated and better known than the wonderful Morgan gem collection exhibited on the upper floor of the southern wing of the American Museum of Natural History, on the Seventy-seventh Street side.

We can truly say also that none of Mr. Morgan's gifts gave him more pleasure, and his interest in the collection was as keen the last time I spoke to him as it had been at the outset. That one so familiar with the best in all branches of art should be a lover of beauty of form and color goes without saying, and we may add that his thorough appreciation and understanding of the finest examples made him a severe critic in such matters, rendering him intolerant of everything mediocre, commonplace or uninteresting. And he possessed withal a wonderfully retentive memory of what he knew was in the collection or of what he had seen, which only enhanced his admiration of what was exceptionally fine.

Until 1882 scarcely any attention was paid to precious stones in the United States. A few years before that date I had seriously taken up the subject of studying and collecting gems, and had prevailed upon Messrs. Tiffany and Company to preserve the best examples that presented themselves to form the collection which was exhibited in a circular pavilion at the Paris Exposition of 1889, in the center of the American section.

At the solicitation of the late Morris K. Jesup, president of the American Museum of Natural History, Mr. Morgan presented this entire collection to the Museum. The specimens were displayed in two long cases on the upper floor, and some five years later the fact that the tile pavement on both sides had been worn to a considerable depth along the line where the cases stood, gave testimony to the interest excited in the general public.

The success of the first collection led me to believe that a collection of precious stones of other than American origin would be worthy of a greater national exhibition, and a consultation was held with Mr. Morgan. As a result a new collection was made and proved to be larger than had originally been anticipated. It was purchased on condition that it should be shown at the Paris Exposition of 1900 where it received a Grand Prize and occupied a most important position in the Department of Mines.

This latter collection was the result of a trip throughout Europe, Asiatic Russia, the United States and Mexico. The finest examples were obtained by purchase frequently, sometimes however only through exchange with

collectors or museums. This collection is now installed in the American Museum of Natural History, a crowning glory to the many magnificent assemblages of other things in the Museum.

The collection is especially remarkable for the many unique things it contains, among which are the most perfect large sapphire known, a Babylonian ax-head of banded agate, four thousand years old, and a wonderful series of sapphires, blue, pink, salmon and brown. There is also a magnificent series of beryls; a large series of tourmalines; an immense section of jade — an entire boulder but so thin that it measures not more than one eighth of an inch through. The great hyacinth with the portrait of Christ engraved on it, the gift of a Vatican cardinal to a friend, is in this collection.

The two collections as eventually completed consist of 2176 specimens of gem-stones, objects of precious-stone, and 2442 pearls. Taken in its entirety the present collection is the most extensive and carefully selected display of rough and cut stones in existence. The specimens of ancient Babylonian minerals represented by engraved cylinders constitute in themselves a quite unique possession, and the same may be said of the collection of opals and of the collection of kunzite specimens. Magnificent cut specimens of morganite must also be noted, as well as a mass of quite transparent aquamarine, the heart of the great crystal found at Marambaya, Brazil, a piece weighing fourteen pounds. This mass of aquamarine is the largest piece of gem beryl known. There are also magnificent crystals of rubellite found during the past year at Pala, San Diego County, California.

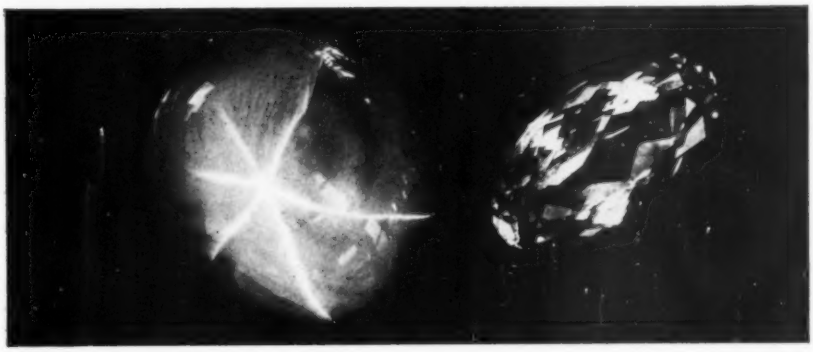
A gigantic geode thirty-five feet in height and twelve feet in width, lined with magnificent amethyst, was discovered in Rio Grande do Sul, Brazil, in 1899. This was carefully broken apart and the five largest masses measuring several feet and covered with the finest crystals, of one to two and one half inches across, many of them perfect gems, are in this collection.

The diamond crystals of American origin are quite unique, notably, a diamond crystal weighing $15\frac{2}{32}$ carats, found in gravel and clay of the Kettle Moraine, near Eagle, Waukesha Co., Wisconsin; another of $3\frac{14}{16}$ carats, a perfect octahedron, from Kettle Moraine, two and one half miles southwest of Oregon, Dane Co., Wisconsin; two diamonds, one of $4\frac{1}{2}$ carats from Lee Co., Alabama, and the other of $4\frac{17}{64}$, from Shelby Co., Alabama; diamonds found in a rock from Kimberley, South Africa and from the Vaal River, South Africa, as well as a number of pink, brownish, yellow and white diamonds, and some of the interesting round sort of the greatest hardness and density. The diamond collection comprises eight cut stones, ten ring-gems and six in the rock.

The sapphire collection numbers 166 specimens, many of them magnificent examples, such as a great blue gem from Ceylon of $158\frac{23}{32}$ carats; a violet stone of 33 carats from Siam; a superb yellow sapphire of 100 carats from Ceylon; one of a golden yellow weighing $73\frac{1}{2}$ carats, and a yellow and blue one of 154 carats, also from Ceylon. There is also an engraved Indian sapphire of $14\frac{7}{32}$ carats. In addition to these we have an endless collection of purple, greenish yellow, pink and salmon-colored sapphires.

Among the rubies must be noted one from Burma, weighing 47 carats. Six rubies from Cowel Valley, Macon Co., North Carolina, weigh together $6\frac{2}{3}\frac{3}{2}$ carats. A Burmese ruby carved as a head weighs $8\frac{1}{1}\frac{3}{6}$ carats. In addition there is an interesting collection of gem-corundums, green, yellow, pink and other colors, from near Coral Creek, Montana, and a series of fine blue stones from Yogo Gulch, Fergus Co., Montana.

The collection is also enriched with a number of interesting natural crystals of unusual beauty and a large sapphire of yellow and blue, as well as with the first sapphire



The greatest and one of the most perfect star sapphires known. The star sapphire is one of the most admired of gems, the perfection of the six-rayed refraction which gives it its name varies greatly in different stones and is somewhat influenced by the color of the stone and the convexity of its polished surface

A cut gem of morganite (57¼ carats) from Madagascar. Morganite is the pink beryl of Madagascar, which is identical with the pink gem of the same mineral found in southern California

ever cut from material found in the United States. Besides these magnificent crystals there are a number of dark blues, pale blues, purples, greens and whites, as well as some of grayish black and brownish color from Franklin, Macon Co., North Carolina.

The beryl group comprises 57 beryls, 30 aquamarines and 13 emeralds and includes golden beryl and morganite. It is notable for the splendid cut morganite of $57\frac{1}{4}$ carats from Madagascar. There are aquamarines of $214\frac{7}{8}$, $271\frac{7}{8}$ and $159\frac{9}{16}$ carats respectively, from Adun-Tschilon, Siberia; another of $156\frac{9}{64}$ carats and a great bluish-green gem of 355 carats from Ceylon. There is a beautifully cut emerald of $32\frac{1}{8}$ carats from the Muso Mines, United States of Colombia; a cut gem of 4 carats from Earles Station, Blacksburg, South Carolina; an engraved emerald of Indian workmanship, executed in the seventeenth century and weighing $67\frac{1}{3}\frac{1}{2}$ carats. To these must be added a series of aquamarines from Mount Antero, Colorado,

A garnet cameo said to be from the Vatican collection, engraved with a bust of Christ in profile

CARVED JADE BOWL

Mottled jade (Nephrite), deep sage green, with conventionalized motives of chrysanthemum flowers and leaves. An appreciation of the uncommon skill exhibited in this jade carving will be awakened upon considering the extreme toughness of the material, almost equalling that of quartz, and the adroit art which has shaped it from a rough block of stone. The length of the bowl is twenty inches

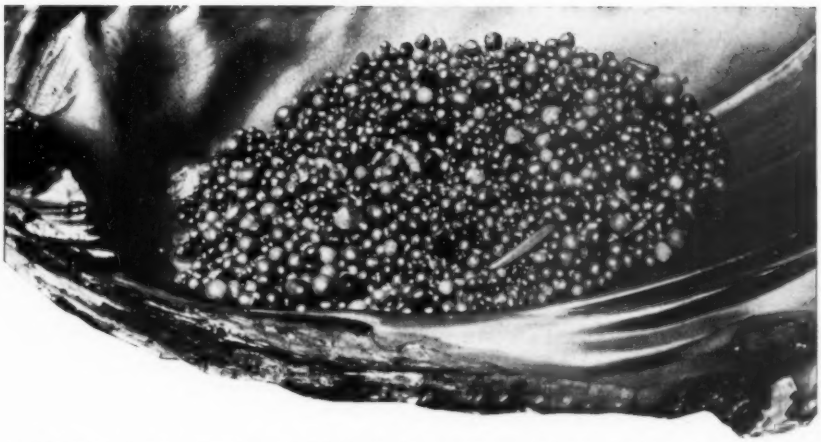
The jade pieces number only about two dozen as it was decided at the time of making the collection not to supplement the great Bishops Collection and other treasures of the Metropolitan Museum

A superb group of amethyst crystals [height 5¾ inches] from Upper Providence, Delaware Co., Pennsylvania. In these gem crystals the purple coloring is unevenly distributed, as in the Siberian amethysts making a rich royal purple tint in the cut stone equal to that of any known gem

found at an altitude of 14,000 feet, in the zone of almost perpetual snow. Additional specimens to be noted are some wonderful yellow beryls from Ceylon, one of $57\frac{9}{16}$ carats; a beryl of $12\frac{1}{4}$ carats from Mt. Mica, Paris, Maine; twelve stones, one of $14\frac{29}{32}$ carats from Litchfield, Connecticut, and a deep brown specimen from the Ray Mine, Mitchell Co., North Carolina.

The collection of tourmalines numbers 79 cut and 13 uncut specimens. Here we have examples as varied as the sapphires in their coloring. There are magnificent red and pink stones from Pala Chief, California; one from Madagascar weighing $40\frac{1}{8}$ carats; another from Sarapulka, Russia, as well as specimens from the state of Minas Geraes, Brazil. A large irregular mass is said to be from the eye of an idol in India and to have been secured during the Sikh war. A series of the wonderful bicolored stones, part yellow and green, the balance of the stone being red, are from Mesa Grande, California; there is also a red and blue bicolored stone from the same locality. Noteworthy and interesting are some tourmalines from Brazil in which there is a red center bordered by white, with an outer line of green. A series of more than a dozen blue, dark green and green tourmalines come from the famous locality at Mt. Mica, Paris, Maine.

The topaz series numbers 55 cut and 15 uncut stones. It is one of the most



Portion of fresh-water clam shell holding a cluster of pearls. Pearls of the greatest value are satiny in surface, pearly white in color, and almost ideally perfect in symmetry. Such pearls command the highest value. The pearls in the Morgan collection number 2442. The series includes a large number collected in different parts of the United States to illustrate varying forms and colors

important, embracing magnificent blue gems, one weighing 308¼ carats from Ceylon; another of 98$\frac{1}{32}$ carats from Alabaschka; a round blue stone of 120 carats from Ceylon; another great topaz of 600 carats, faultlessly cut, comes also from Ceylon. It is the masterpiece of cutting of one of the greatest lapidaries who has ever lived in India, as is also the blue Ceylon stone of 308¼ carats. The yellow and pink topazes from Minas Geraes are superb; one of a deep yellow weighing 61 carats, and a darker one, more brownish yellow, 46½ carats. Then there is a splendid triangular, sherry-colored stone, weighing 16$\frac{29}{64}$ carats from Ceylon; a beautiful pink specimen of 19$\frac{7}{16}$ carats and another of 49$\frac{5}{32}$ carats from Ouro Preto, Minas Geraes, Brazil. A great pale amber-colored stone of 193¾ carats is from Cheyenne Mountain, El Paso, Colorado; there are also specimens from Australia and other localities.

In the quartz series among the rock crystals, Spanish topaz, and rose quartz, there are many fine specimens — notably the two crystal balls from Mokelumne Hill, Calaveras Co., California. The one of 5½ inches diameter weighing 6.3 pounds is flawless; the other of 7⅛ inches diameter with a weight of 8.17 pounds, is a large piece of crystal containing numerous natural markings. There are wonderful examples of seals and other ornaments cut by the famous lapidaries of the Ural Mountains and by Chinese lapidaries of the seventeenth and eighteenth centuries, as well as vases and snuffboxes by the expert lapidaries of the Nahe Valley in Germany.

The amethyst series is fully as complete and contains many unique gems, such as a great group of crystals from Upper Providence, Pennsylvania, and a carved hand of Buddha from Japan. There may also be seen a large hexagonal gem, three sectors white and three sectors purple, and a magnificent royal purple gem of 142$\frac{5}{32}$ carats from the Ural Mountains. Some large and superb gems come from North Carolina; Deerhill, Maine, and other localities.

The garnets are represented in their full range of color — red, purple, honey-color, brown, green and black. A remarkable series of spessartite comes from Amelia Court House, Virginia, several dozen gems weighing from one carat to the great gem of 96$\frac{1}{16}$ carats. The two finest found in this locality weigh respectively 33$\frac{5}{16}$ and 36$\frac{44}{64}$ carats and are unique in size, perfection and color.

We have already noted the hyacinth cameo, engraved with a bust of Christ in profile, said to have been in the Vatican collection. A garnet bowl engraved with Indian designs weighs several ounces, and a small dish, cut from garnet found at

Salida, Colorado, is nearly two inches across. Certain of the ruby-red garnets were found on the ant-hills of the Navajo Reservation, New Mexico, where they had been brought out by the ants. Rose-purple rhodolite garnets come from Franklin, Macon Co., North Carolina.

Several dozen demantoid garnets, so often erroneously termed olivine, of a rich emerald green with a light tinge of gold and showing a play of color like the diamond were brought from Poldnewaja, Ural Mountains. A magnificent polished garnet crystal weighing over a pound comes from Salida, Colorado.

One of the most brilliant cases of the collection is the opal case which contains many fine gems. In it may be viewed a wonderful series of two dozen rich golden and fire opals from Querétaro, Mexico, and a number of fine specimens from White Cliffs, New South Wales. A mass of precious opal weighing nine ounces originally formed the bone of a prehistoric animal and was naturally changed to precious opal.

It was intended that the collection should not only represent the varieties of precious stones and the various forms of cutting and working these in ancient, mediæval and modern times in all nations, but should also include the stones in more especial use in different countries, manipulated, carved or cut by the artisan of the country in question. Groups of carved gem-stones may be seen in the form of fruits, and there is a series of carved vases made in Siberia, where the industry was introduced by Catherine the Great, who sent two Italian lapidaries to teach the natives, with the result that at the present time more than one thousand people are thus making a good living.

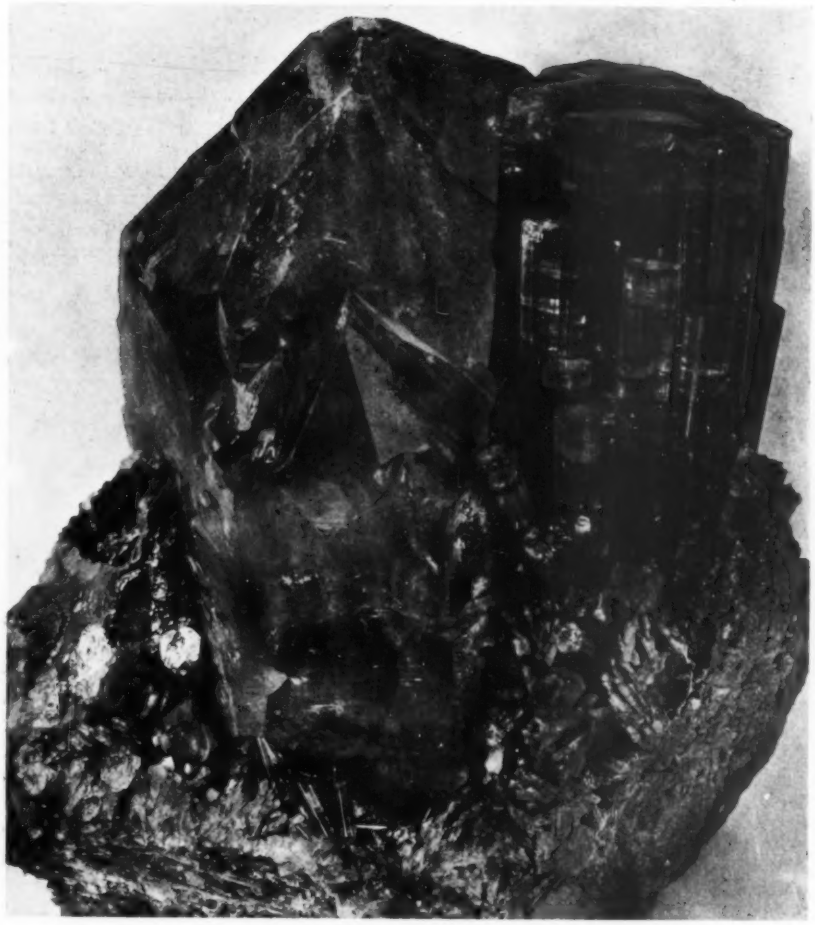
Amber is a treasure that has been prized from the earliest times. To secure it the Phœnicians visited the Baltic; the Germans have traded it to China, Africa and to many distant lands; it has been found in French graves and it is worn in the form of beads by the natives of Africa.

Here we have it represented in a variety of forms, such as Indian beads and snuff-bottles of Japanese manufacture; there are also some pieces containing insects which were imprisoned millenniums ago in the gum of the tree. For amber is not indeed the tears of the Heliades as the classic myth explains, but the tears oozing out of the bark of wounded trees, as was in fact believed by some of the more enlightened among the ancient writers.

When the lilac and purple spodumene was found in 1903–4 and named kunzite, Mr. Morgan acquired a series of the finest stones, some of which had been figured as type specimens. This interesting series of crystals included some really wonderful gems. We may instance one of 224½ carats, the largest type specimen. Another superb gem weighs 118 carats.

The jade collection comprises only about two dozen examples. It was decided not to supplement the great Bishop Collection and other treasures of the Metropolitan Museum. But there are some important pieces of Chinese jade, such as a great bowl measuring twenty inches across; a white bowl of twelve inches diameter, with two swinging handles; a jade cup, with cover jeweled with diamonds and rubies, from India; a bowl of jadeite (melting snow) and an ellipse-shaped bowl of seven inches diameter, mounted on gold and enamel, originally belonging to Louis XVIII. A jadeite figure from the Valley of Mexico weighing four pounds is also here, and a snuff-bottle and a green vase seven inches in height.

No single specimen is of greater importance from an archæological point of view than the ancient axhammer of banded agate. This was obtained by Cardinal Borgia while at the head of the Propaganda. It was offered by the Countess Ettore Borgia to the British Museum, but was eventually acquired by Count Michael Tyskiewiecz for 15,000 francs ($3000); soon after his death it was purchased by Messrs. Tiffany and Company and was presented by Mr. Morgan to the American Museum.



The carmine tint of this rubellite [height 9¼ inches] in contrast with the almost colorless and glassy surface of the quartz crystal forms a mineral wonder. Rubellite is a lithia variety of the variable silicate known to mineralogy as tourmaline and the intergrowth of quartz and tourmaline is noticed at many localities. Invariably the quartz as a secondary crystallization has formed around its mineral companion, as a foil to the showier associate

We have touched upon the historic value of the series of Babylonian cylinders, composed of various minerals such as serpentine, steatite, hematite, lapis-lazuli, jasper, agate, anhydrite, amazon stone, shell, aragonite, chalcedony, marble and quartz. These cylinders date from 4000 to 400 B. C., and are inscribed with figures and names.

To illustrate the history of gem engraving there are fine examples of Persian engraving offered by a series of fourteen Persian seals of various ages, bearing from a few to several hundred words of the beautiful tracery engraving that only the Oriental can accomplish with full success.

Agatized wood from Chalcedony Park, Arizona, is well represented, some sections measuring two feet across, polished as smooth as the finest mirror, and showing parts of the prehistoric trees replaced by silica and oxide of iron, as if nature had painted them in orange, red or brown, in pinkish or bluish hues, and in other colors, fairly

rivaling the brush of any modern artist. The rock crystal is at times accompanied by crystals of rutile, hornblende and tourmaline. In these the hairs are frequently as fine as human hair and again they may be as thick as the lead of a pencil. In the white colorless quartz the crystals are nine inches long; in others the crystals are brilliant reddish brown, twisted and distorted. Fine delicate rutile "hairs" in quartz crystal come from Madagascar. There are some interesting quartz crystals in which the successive growths of the crystal have been registered by a deposition of some other substance as the quartz was growing, presenting a series of "phantom crystals." These have been polished on the sides.

The skill of the lapidary in cutting and polishing excessively thin sections of precious minerals is demonstrated in the case of a piece of jade thirty inches in length, twenty-four inches in width and one-fourth of an inch thick, polished on both sides, a triumph of lapidary work. Another example from the Onot River, from distant Siberia, is a section of a boulder skillfully mounted, only one-sixteenth of an inch thick, and yet measuring twenty inches in length and twelve inches in width. A section of a meteorite from Kiowa Co., Kansas, is filled with golden yellow olivine (peridot).

The turquoise exhibit is of unusual interest; very notable is the great Persian turquoise engraved with two thousand words, an entire chapter of the Koran; this laborious task must have required a year's time for its accomplishment. Additional examples here are a turquoise matrix from Persia; bone turquoise (odontolite) from France; a magnificent turquoise from Los Cerrillos, New Mexico, as well as beads and charms made, mounted or cut by the Navajo Indians.

The pearl series numbers 2442. It contains a great variety of examples collected to illustrate the various forms and colors of freshwater pearls in the different parts of the United States. Some of them are large and important gems and are of great beauty and value. There is an extensive series of common clam, abalone and conch-shell pearls.

The rare gems are well represented, such as the titanite from Tavetschtal, Switzerland, which almost rivals the diamond in brilliancy.

Of other gem-minerals we have brown and gold andalusite from Ceylon; euclase from Brazil; cut sphalerite from Santander, Spain; cyanite from Russia and Bakersville, North Carolina; apatite from Georgia and from Canada; rutile; sunstone; chlorastrolite from the one locality in which it is found, Isle Royale, Lake Superior, Minnesota; prehnite from Paterson, New Jersey; oligoclase from New Bakersville, North Carolina; microcline from Norway; thomsonite; willemite; hyalite from Lake Co., California; and many others. Moonstone is well represented by a number of large and beautiful gems.

The agates and moss agates form a great series of large, important and beautiful specimens, notably the great bowl that measures thirteen inches across, cut out of natural agate and showing the wonderful mammillary structure. Some "mocha stones," as agates are termed in India, measure four inches across. Interesting in their way are a number of beautiful smaller pieces from Brazil and Wyoming.

The Morgan collection at the 1900 Paris Exposition aroused such great and universal interest in gems and minerals, that when Mr. Morgan's attention was drawn to the Bement collection of minerals he realized that the people as well as the Museum authorities would greatly appreciate it, and he generously presented to the Museum this greatest private collection of minerals, embracing also one of the greatest private collections of meteorites.

To recapitulate, the catalogue of the collection numbers 2064 cards listing the following specimens: pearls 2442; diamonds — rings, 10, cut stones 8, in rock 6; sapphires 166; beryls 57; aquamarines 30; emeralds 13; topaz, cut 55, uncut 15; tourmaline, cut 79, uncut 13; beads 500; cylinders (Babylonian) 32; shell cameos 3.

A TREASURE HOUSE OF GEMS

AN APPRECIATION OF THE BEAUTY OF THE MORGAN COLLECTION IN THE AMERICAN MUSEUM OF NATURAL HISTORY

By L. P. Gratacap

UNITED with each other in clustering groups, as in jewelry and decorations, gems gain in splendor, yet the claims of education in the halls of a museum of natural history demand that gems for specific study be individualized and separate. The only way to produce the impression of richness and brilliancy is to have them profusely shown, to be lavish and generous in examples, with a kind of luxurious extravagance even that startles.

In the Morgan gem collection something of this effect is indeed produced. As we pass in review the cases in the gem room, each with few exceptions devoted to a single gem, the aggregate effect is sensibly imposing — a feeling reflected in the average visitor by his bewildering estimates of its value. Admiration arises in part from the comprehensiveness of the collection, the wide embrace within it of the minerals that may serve the purposes of decoration, or enter, less conclusively as gems, into works of art, the rococo of the artificer in quartz, jade, jadeite, rhodonite, fluorite, gypsum, serpentine, agate and chalcedony.

Herein has been displayed the exhaustiveness of Dr. Kunz's inquiry, sympathy and learning, for the present Morgan collection of gems is practically the consolidation of the two World's Fair Exhibits of Tiffany and Company at Paris in 1889 and 1900, and Dr. Kunz gathered for those occasions something suitable from every available source.

The primacy of gems remains, to-day as always, with the diamond, the sapphire, ruby and emerald, curiously invaded by that frail product of the sea and the river, the pearl of which Julius Wodiska says, "In its purity, liquid beauty, and charm of romantic and poetical association the pearl — aristocrat of gems — leads even its peers of the highest rank, the diamond, emerald, ruby and sapphire." Perhaps we might quarrel with this impersonation of the pearl, but there can be no hesitation in ascribing to it a wonderful charm as we see the varied and fascinating display in the Morgan collection.

From this case of pearls the visitor may learn also the scheme devised by Dr. Kunz for the whole collection of gem-material, that it might subserve quite completely the purposes of scientific discrimination and comparison. In this case of pearls are the calcareous secretions of the hard-shell clam (*Mercenaria mercenaria*), our edible quahog; the less attractive offerings from the pearl factory of the common oyster; the rosy rolls from the giant whelk of the south (*Strombus gigas*); the dissymetric nodules, with their vivid sheens, from the abalone (*Haliotis splendens*) of California, and the priceless dainty and delicate spheres, pale silvery and lilac-tinted, from the mantles of the freshwater clam (*Unio*). Here are perfect and baroque pearls, hinge pearls and pearlaceous masses, the exhibit unduly

limited for want of space to accommodate the abundant overflow now hidden in storage.

The visitor leaning over that variegated garden of the sapphires learns with interest the remarkable range of colors in this gem: the vivid electric blues, paler cerulean hues, the deep pansy tones, the pinks, translucent and feeble, and the almost opaque turgid pigeon-blood stones, and green, golden yellow, salmon, gentian, to colorless water stones. The opposite case reveals the superb play of color in beryl from the peerless emerald, through haunting changes of blue and green in the aquamarines, to the saffron yellow of the golden beryl, while near it is the amazing show of tourmaline, surprising in its vagaries of sharply lined and interblended tints, with its contrasted triple points of emphasis in green, red and blue. The topaz, less arrestingly, exhibits its departures from convention in the burnt half-caramel tone of the Brazilian stone, to gentians (mostly artificially produced), yellows, and the limpid masses.

Case follows case, holding the precious and semiprecious stones, approximately in the order of their commercial merit, an order not invariably sustained by taste, and yet practically valid. The chrysoberyls (alexandrite) with their tantalizing caprices of color, the rather insipid spinel; the rich moorish browns of the zircon, among which note the raspberry glints of the hyacinth, the effective bottle green of peridot, and the coarser — yet at times refined to the point of a deliberate superiority almost over ruby — garnet with its audacious greens and honey-yellow spessartites.

Here is a supremely showy case of the chameleon amongst gems, the tortuous and vagrant opal, and here a splendid group of amethysts — the bishop's stone — with a regal group of crystals from Delaware County, Pennsylvania, in the center of it. A case of mingled degrees and orders, in the hierarchy of gems, adjoins it, where, with recognized families as the moonstone (*adularia*), are joined a host of lesser aspirants to fashionable attention, such as titanite and euclase, a motley throng not unlike the obsequious courtiers before the gates of Timon of Athens, seeking honors to which they have no claim.

But to some eyes, more beautiful almost than anything else are these marvelous lilac, gentian, or pale carnation slabs of kunzite (spodumene), a mineral wonder, found buried far below all human contact in the mountains of southern California, and now fascinating the world of ostentation with its subtle radiance.

Here too is amber and turquoise and gold, lovely in themselves but lovelier in combination, and then, with a fine challenge to the prerogatives of the sister museum, are carved, cut and polished vessels and designs in quartz, chalcedony, agate, jade and jadeite.

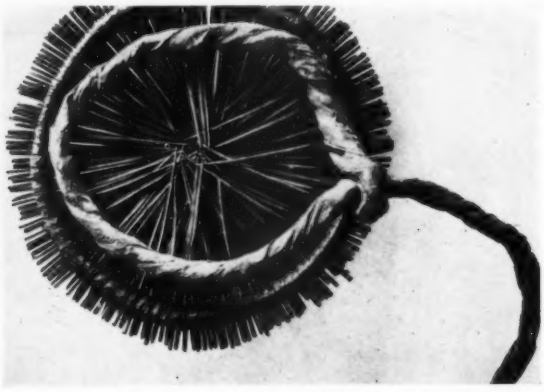
It must always stand true that this treasure-house of beauty is in itself a wonderful monument to the man who thus generously enriched the American Museum.

CARVED AND POLISHED CHALCEDONY–AGATE BOWL

This bowl measures thirteen inches in diameter and is cut to show the mammillary structure of the natural agate. The carving and polishing of such a vessel implies patience, skill and a developed artistic appreciation of the natural qualities of the stone. The headquarters of the larger portion of agate-cutting and polishing is at Oberstein, Germany

"THE LAST STAND"

Model by Mr. Carl E. Akeley for elephant bronze. [Photo one-fourth size of model]



The elephant trap used by the Kara Moja consists of a "basket," such as is here shown, and a slip-noose of rawhide cable placed over a hole dug in the trail. The cut shows the Kara Moja antelope trap which is similar to the elephant trap but of smaller size

THE WORK OF CARL E. AKELEY

WORK on the elephant group planned by Mr. Carl E. Akeley for the American Museum is to begin in early summer. Many studies are already in progress both for the group and for supplementary miniature groups and single figures to be cast in bronze and used to supplement the life size group, thus illustrating in full the character and habits of the African elephant.

Some of Mr. Akeley's work is to be seen in the Chicago Field Museum — a series of groups of African mammals, a very beautiful seasonal series of the Virginia deer and as the central piece of the Museum a statuesque group of two elephants. At present Mr. Akeley has connection with the Field Museum in an extension of the African mammal series, working at the moment on an African buffalo group of large proportions.

The elephant group planned for the American Museum, a family group of massed elephants, five in number, is destined for the center of the African hall in the proposed new wing. The group, statuesque in effect, without habitat, will tower eighteen feet from the floor, elevated four feet on a pedestal base in order to give an unobstructed view on first approach from the ends of the hall over two low groups of rhinos one at either end. These three groups in a space 44 by 136 feet will be mounted according to Mr. Akeley's newly devised method for non-haired mammals which gives them the permanency of bronze and allows exhibition without cases, exposed to the varying heat and humidity conditions of the open hall.

The elephant group will have in addition to the correlated bronze miniature groups and single figures already mentioned, bas-reliefs in bronze on the sides of the pedestal. These will show the massing of the animals in herds, and other features of the story of the African elephant and its relation to the country and to the natives. As planned, the great central space of the hall with its elephant and rhino groups will be encircled by a series of thirty-two panoramic groups with habitats and painted backgrounds, each composite in character, so that together they will show several hundred species. The corner groups for instance will represent the Congo forest (okapi the center of interest), African plains, African desert with typical water-hole (giraffe the center), and a river scene of Africa. Each of these will contain many species, the last for example, crocodiles, hippos and turtles in the water, and in the trees that border the river different species of monkeys and birds. These thirty-two groups will be in cases so constructed as to be under automatic control regarding light, temperature and humidity, entirely independent of the varying conditions in the main open part of the hall.

Two requisites underlie successful work in taxidermy — as the mounting of animals for museum exhibition is known — in addition to accuracy of the scientific truth to be demonstrated. The first of these is technique of such

"THE WOUNDED COMRADE"

Model by Mr. Carl E. Akeley for elephant bronze. [Photo one-third size of model]

MODEL OF "THE WOUNDED COMRADE" VIEWED FROM THE RIGHT

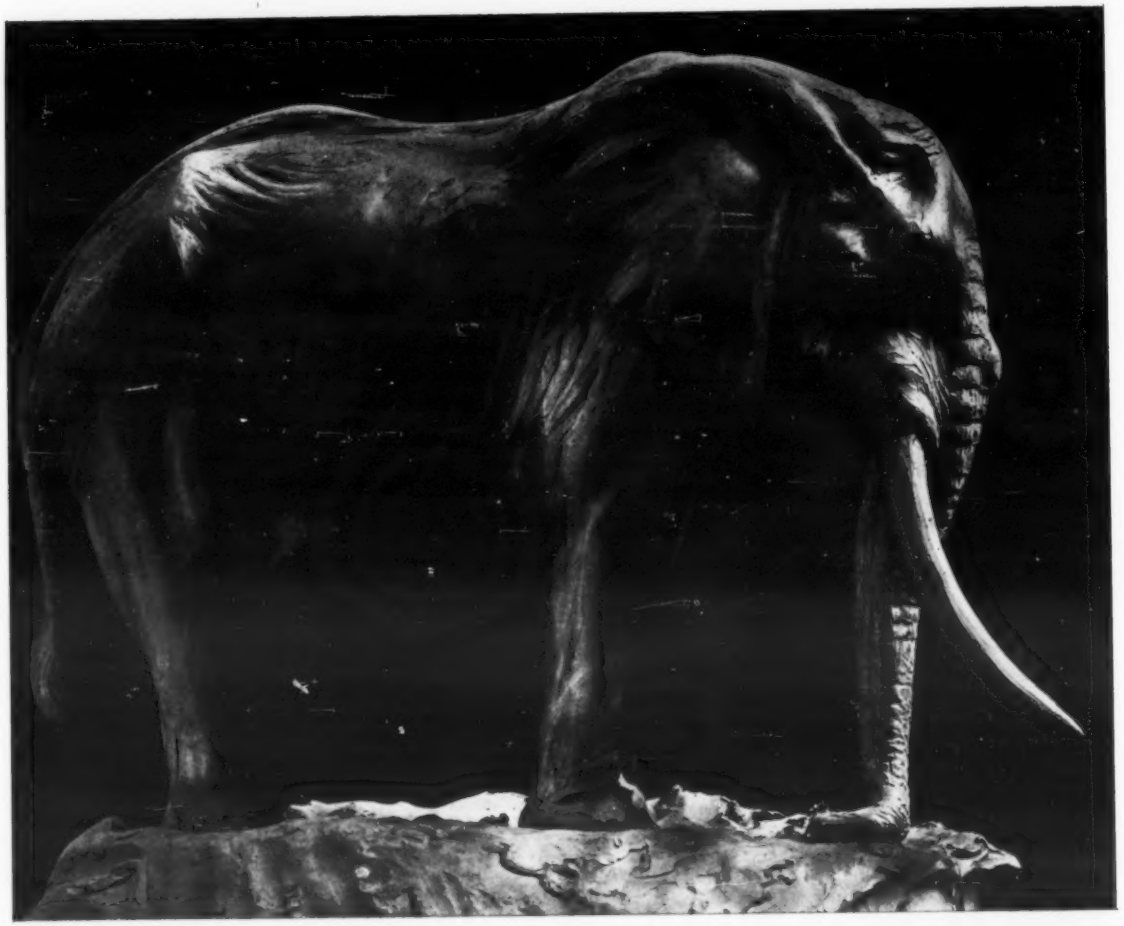
An old bull elephant seriously wounded is being helped away from the danger zone by his two companions. Most elephant hunters of much experience have stories to tell of such instances which are of quite frequent occurrence. Such assistance is probably more often given to old bulls than to younger bulls or cows. This marked affection for an old bull on the part of the rest of the herd — both sexes — is strikingly apparent

176 MODEL FOR BRONZE, "THE WOUNDED COMRADE," VIEWED FROM THE LEFT

"A PORTRAIT"

Model for bronze by Carl E. Akeley. Study of an old single tusker with whom Mr. Akeley came to feel quite familiar, coming upon him three times at points from thirty to fifty miles apart. This splendid old fellow was recognizable not only by the one fine tusk but also by a large swelling near the base of the trunk which may have been the result of a thrust of a tusk in a battle with a rival. The loss of one tusk was doubtless a blessing for had he carried a mate to the one that he had, no sportsman or ivory-hunter, white or black, would have passed him by

Mr. Akeley tells of the third meeting as follows: "We were hunting and studying elephants in Ungoro. We had made camp one afternoon near the village of a handful of natives, the remnant of a population which had been all but exterminated by sleeping sickness, when natives came to us saying that a single bull was within an hour's distance. They took us directly to him when we immediately recognized our old friend of the single tusk and the bump on his face, all unconscious of danger as he slowly gathered a "trunkful" of dirt and threw it over his back. For the third time we made our salaams and withdrew"



character that not only is the mount flawless in workmanship but it is fitted also to endure unchanged for many years — fifty, one hundred, surely even longer. For in this age of advanced experiment and knowledge such a result alone justifies the money and effort. Still more important than money and effort however, is the fact that the animal life of the globe in its wild state, especially the large mammal life, is in very large part approaching extinction because of the encroachments of civilization. For this reason, museum records made to-day should be historical in that they embody accurate knowledge in permanent form for the future. Also it chances that the knowledge which can be put in the graphic form of groups is precisely that part of zoölogical science which it is most important to-day to preserve — namely, field knowledge or ecological records, the interrelationships of any given race of animals with other races and with environment, which if not gained in the near future will be lost forever. Collections are important (and they too must be put into shape for enduring) and they must be made in large series before too late. Work on them however, with the systematic, anatomical and comparative results which in combination are of such intrinsic value in the general body of science, will not be injured or lost by delay.

The demands of the time in the matter of ecological record are strong upon museums and particularly upon the American Museum which aims in so large a degree to put its information in graphic form because of the enhanced educational value. Therefore that the opportunity seems at hand when Mr. Akeley will give his power as a taxidermist to express his large field knowledge of African mammals, is a triumph for science even in greater degree than for taxidermy or for the development of the American Museum.

But there is a second requisite for the adequate mounting of animals. It lies in a combination of the life and of art, a choice of life facts, positions, relations such as can be set forth in accordance with what we recognize as artistic effect. The taxidermist who can produce flawless and relatively enduring technique is rare; the man who combines with these the second requirement is still more rare. Mr. Akeley stands pretty much alone, far and away the best taxidermist of the world. Quoting a critic of repute in museum matters: "Mr. Akeley to the men who often bear the title of taxidermist stands as Rodin and French to the cave artists."

THE PERSONNEL OF THE CROCKER LAND EXPEDITION

By Edmund Otis Hovey

THE organizing institutions of the Crocker Land expedition consider themselves fortunate in the personnel of the staff and congratulate the scientific world at large upon the results that may reasonably be expected to flow from the energy that has been and is to be put into the enterprise.

The leader of the party, Donald B. MacMillan, who was coleader with George Borup of the expedition as originally planned, won his spurs in Arctic work as one of Admiral Peary's trusted lieutenants during the successful quest of the North Pole in 1908–1909, traveling more than two thousand miles with dog team along northern shores, even to the most northern point of land in the world, Cape Morris Jesup. It was from this point that MacMillan and Borup made their record march covering 336 miles in eight days. Mr. MacMillan is a graduate, A. B. and Honorary A. M., of Bowdoin College. He has spent the three and one-half years since his return from the Arctic in studying, lecturing and traveling. The summers of 1910 and 1912 were spent in exploratory, ornithological and archæological work in and along the coast of Labrador. The year 1910–1911 and the past autumn and winter have been spent at Harvard University working in anthropology and practical astronomy. Mr. MacMillan is of Scotch ancestry and was born in Massachusetts thirty-seven years ago.

W. Elmer Ekblaw was born in Illinois and is thirty years old. His portrait shows him as he is, strong, sturdy, self-reliant and reliable, as befits his Scandinavian ancestry. He took his degrees A. B. and A. M. in course at the University of Illinois, specializing in geology, botany and ornithology. He is a valued instructor in geology at his Alma Mater. He has done much field work in that science and will have charge of the geological and botanical work of the expedition.

Ensign Fitzhugh Green, U. S. N., graduated at the Naval Academy, Annapolis, four years ago, when he was only twenty years of age. He was born in Missouri of old Colonial stock and received his appointment to the Academy from that State. Mr. Green's experience has been largely at sea, where his duties concerned navigation and all the complicated machinery of a battleship. He was in command of a turret on the "Michigan" and has likewise done mapping of coast lines. He has been taking special studies during the past year in cartography, meteorology, seismology, terrestrial magnetism and wireless telegraphy in Washington, D. C. and will have charge of these branches of the expedition work. His experience in the navy has already taught him how to command as well as to obey.

Maurice C. Tanquary is a Wisconsin boy, although his parents and his grandparents for several generations were born in New England. He was

graduated from the University of Illinois in the same class with Mr. Ekblaw, but he continued his college work at the same institution to include the degree of Ph. D. He specialized in zoölogy, more particularly entomology, and he is well fitted to take charge of the zoölogical work of the party including that on fishes and mammals. He is thirty-one years old and is full of the life and vigor that will be invaluable to the party during the long hours of darkness in the second winter.

MR. MAURICE C. TANQUARY

[*Upper photo*]

Mr. Tanquary is a graduate of the University of Illinois. He will act as zoölcgist of the Crocker Land expedition

MR. W. ELMER EKBLAW

[*Lower photo*]

Mr. Ekblaw, instructor at the University of Illinois, will have charge of the geolcgical and botanical work

ENSIGN FITZHUGH GREEN, U. S. N.

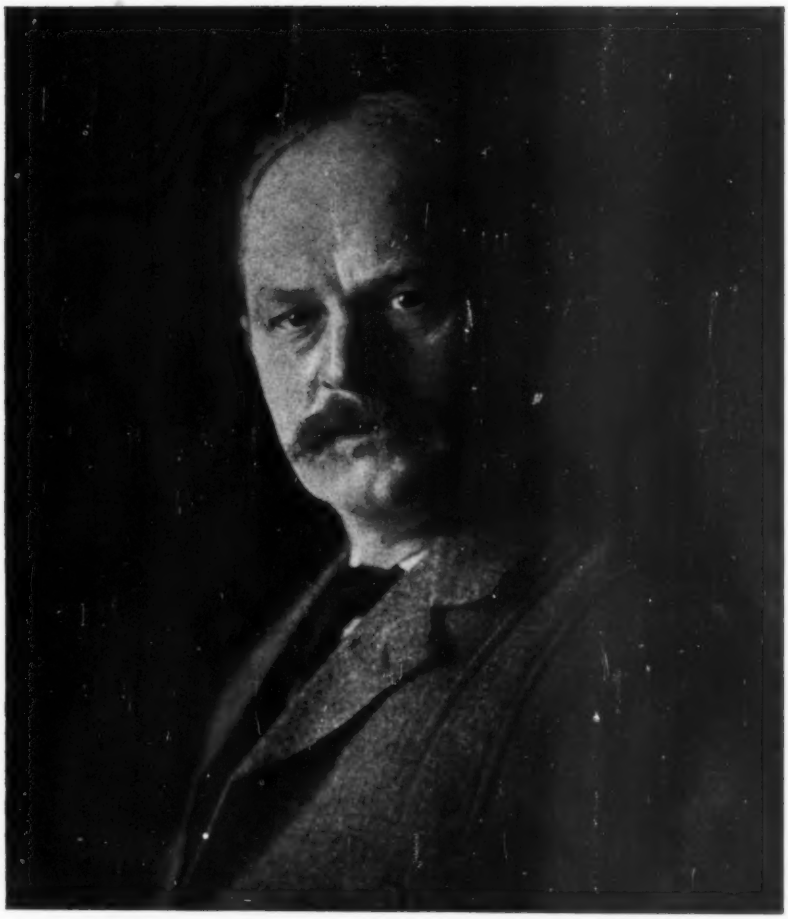
Ensign Green, who joins the Crocker Land expedition which is under the leadership of Donald B. MacMillan, is a graduate of the Naval Academy, Annapolis, and has had experience at sea, in part on the "Michigan." He will have charge of the meteorology, the mapping of coasts, records of earthquakes, wireless telegraphy and allied work

In addition to the strictly scientific staff of the expedition there will be a surgeon. The climate of the Arctic regions is so healthful for white men that there is not likely to be much for the doctor to do for the staff aside from the treatment of frost bite and the results of accidents, but the Eskimo furnish a fertile field for medical study and maintaining the health of the whole party through properly balancing the diet is of high importance. The surgeon has not yet been appointed although there have been many applicants for the post.

The party includes an expert electrician to have the direct care of the outfit of wireless and other electrical instruments at headquarters and his duties will include making the meteorological and seismological observations during the absence of Mr. Green. A good mechanic and boat-builder who combines also the qualifications of being a good camp cook has been engaged. The whole staff will seem nearly perfect, when a competent surgeon has been secured.

No American expedition has ever gone to the Arctic regions better equipped as to men, supplies and instruments than this, which is to start for the north in July of this year under the auspices of the American Museum of Natural History and the American Geographical Society with the cooperation of the University of Illinois and the assistance of the United States Navy Department, the Department of the Interior (through the Geological Survey and the Bureau of Mines), the Department of Agriculture (through the Weather Bureau), the Department of Commerce and Labor (through the Coast and Geodetic Survey), the Carnegie Institution of Washington (through its Bureau of Terrestrial Magnetism), Yale University, Colgate University, Bowdoin College, Worcester Academy and Groton School.

Such an array of backers gives the enterprise a national character which is further emphasized by the large number of individuals, about one hundred thirty in all, who have contributed liberally of their means and the score or more of prominent publishing houses and other firms that have made either direct donations of their valued goods or concessions in prices that have given the expedition's funds much greater purchasing power than otherwise they could have had. Wireless telegraphy is to be utilized for the first time to further the work of an Arctic expedition. This will be used in connection with the fully equipped weather bureau station to be established at the home base of the party on Flagler Bay (Kane Basin). The idea of being in direct frequent communication with an exploring party north of 79° north latitude is one to stir the blood and fire the imagination, at the same time that it removes some of the terrors of the long Arctic night.



BIRD STUDIES IN THE ANDES

QUOTATIONS FROM THE LETTERS OF FRANK M. CHAPMAN, LEADER OF AN EXPEDITION TO SOUTH AMERICA

MR. FRANK M. CHAPMAN is in Colombia for the purpose of making a study of the life zones of that part of South America. The conditions in the region are peculiar. In a short distance with increasing altitude occur tropical, temperate, sub-boreal and alpine zones, the bird life in each zone distinct from that of the others.

Also studies are being made for a panoramic group to continue the series of bird habitat groups in the American Museum. The following quotations are from letters received from Mr. Chapman during March:

HONDA, *February 9*

....One month ago we left New York but in spite of the fact that the voyage from New York to Baranquilla consumed eleven days and that plowing up the water

— and mud — of the Magdalena twelve more, we already have over six hundred birds and the study for the great Magdalena group has been made. We let no opportunity to collect escape us while sailing up the Magdalena. Whenever the steamer stopped for cargo or firewood the six men of our party rushed ashore — somewhat to the astonishment of the inhabitants, who not infrequently asked if we were starting a revolution! The bird skins were prepared at once on the steamer, where we were given every facility for work by a sympathetic captain.

The view for the group was made at a point above Honda, at an elevation of 2700 feet, near the summit of the first ridge of the Eastern Andes. From this point one looks west across the Magdalena Valley to the Central Andes. The floor of the valley is broken by a series of low, strongly modeled ranges through which the Magdalena winds in graceful curves and the blue wall of the Central Cordillera is crowned by three snow masses, Tolima, Isabel and Ruiz, having an elevation of 16,000 to 18,000 or more feet. In its impressive proportions, its variety of form and color, its singularly beautiful and pleasing composition, this view is by far the finest I have ever seen.

All the men[1] are working with enthusiasm and this in the face of conditions trying even to those of us who have had experience in the tropics. Lying at the western base of the Eastern Andes, the Magdalena is not cooled by the easterly trades and the mercury hangs about 90°, while the air is charged with a high percentage of moisture. I am glad to say that to-morrow we begin our section from the Magdalena to the Meta at the eastern base of the Eastern Andes, thus completing the survey of the three Colombian Andes from the Pacific to the Orinoco drainage....

"HEART OF THE ANDES," *February 25*

....In order to avoid the expense of running a large pack-outfit for the two hundred miles through the Eastern Andes, I have divided the party into two or three each, and am relaying it along the trail with six mules, three for the saddle and three for "cargo," as it is here called.... Things move slowly here and a week was of necessity passed in Bogotá while I purchased the mules and hired men for our journey.... The week was also used to establish relations with resident naturalists (few in number and chiefly French priests), to pay the respects of the Museum to various officials including the President of the Republic, the American and British Ministers, and to ascertain the sources of the so-called "Bogotá" birdskins which for the past seventy years have been reaching the museums of Europe and America, hitherto constituting practically the only specimens of birds from this region.... Investigation has yielded the most surprising and definite results. In brief, the area drawn on by the Bogotá dealers is so large that these dataless specimens are not only scientifically valueless but also actually misleading, and the discovery of this fact alone is worth a journey to Colombia.

BUENA VISTA, *February 28*

We finally reached the summit of the last ridge of the Andes (altitude 4000 feet). At our feet the llanos stretched indefinitely eastward and for the first time since entering the mountains we saw the horizon below us. Westward we look back up the valley of the Rio Negro. Justly is this place named Buena Vista:.... ....It is very rich in bird life. One collecting of sixty-six specimens brought a result of thirty-four species, and in a single morning's work we have collected as many as thirty-eight genera....

[1] The assistants of the expedition are as follows: Mr. Louis Agassiz Fuertes, artist; Messrs. George K. Cherrie, formerly of the Brooklyn Museum, Paul G. Howes of New Haven, Connecticut, Thomas Ring of Saginaw, Michigan, and Geoffrey O'Connell of Ithaca, New York.

With wings extended the albatross runs along the ground until it has headway enough to rise against the wind like an aëroplane

THE ALBATROSSES OF LAYSAN[1]

By Homer R. Dill

Of the University of the State of Iowa

HUNDREDS of miles from the regular course of mail steamers, on a tiny sand-grit island in the middle of the Pacific Ocean, millions of birds have made their homes; here for countless generations they have lived, finding abundant food and suitable places in which to rear their young.

This primitive world, inhabited only by birds, is known as Laysan Island and is one of the Hawaiian group. The island has an area of two square miles, is low and flat, and although of volcanic origin has its upper surface to-day completely covered with coral sand and phosphate rock. The shores are of cream-white sand; the higher ground bordering the beach is covered with a rich growth of low bushes and sand grasses, among which are trailing vines. In the center lies a shallow lagoon unconnected with the sea and not far from the south end of the lagoon is a small fresh-water pond. From the central plane the sloping sides of the old coral atoll basin are plainly visible, rising gently to the higher ground that borders the beach.

In the spring of 1911 I spent six weeks on this island with three assistants, to study local conditions. We found twenty-three species of birds living there, among them the Laysan albatross (*Diomedea immutabilis*) perhaps the most notable.

The birds did not seem to mind the presence of man; as our party toiled up the beach through the loose coral sand these beautiful creatures were

[1] Illustrations from photographs by the Author

PORTION OF A LAYSAN ALBATROSS ROOKERY

Laysan, an island of the Hawaiian group and part of the Hawaiian Island Reservation, is inhabited only by birds. The albatross colony numbers about 180,000

seen on the higher ground, assembled in groups of twenty or more; as we drew nearer they came up to greet us, some of them bowing profoundly. They gathered about as we stopped to rest, pulling at our clothing with their mandibles, and pecking at our luggage. If we offered to touch them they retreated somewhat, but soon returned, their curiosity getting the better of them. In flight the albatross, like an aëroplane, must rise against the wind; with its wings fully extended the bird runs swiftly along the ground until it has gained headway enough to rise. If thrown into the air it cannot fly as do most birds, but instead falls heavily to the ground.

About two years previous to our visit a party of foreign plume-hunters landed on Laysan and for several months made the slaughter of sea birds a business. Had they not been interrupted, they probably would have exterminated the entire colony. As it was, thousands of sea birds were destroyed, especially albatrosses. To-day there is about one-sixth of the original albatross colony left, numbering approximately 180,000 — and to one who has never beheld such masses of birds, this colony is a wonderful sight. The level ground that surrounds the lagoon is wholly occupied by them; also nearly every other part of the island, except the beaches, supports small colonies.

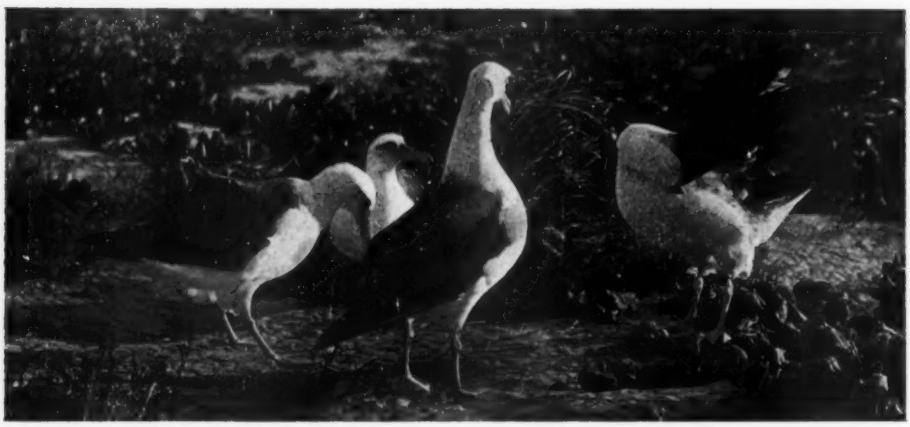
The amount of guano deposited by the albatrosses and other sea birds on this island has been estimated to be about one hundred tons daily. The guano deposits were leased for a number of years to a company in Honolulu but later the business was abandoned. A member of the company reports that although there is an abundant supply of guano it is of low grade, owing to the frequent rains that remove the ammonia.

Much of the time of the Laysan albatross is spent in carrying out a very strange performance. This performance varies, but usually goes on in the following order: One bird approaches another with an indescribable squeaking sound, bowing all the time. If the other bird feels like performing, which is usually the case, he bows in return. They cross bills rapidly several times. Then one bird turns his head and lifts one wing in such a manner that the primaries point directly out at the side. In the meantime the other bird keeps up a loud noise that sounds like the neighing of a horse. The bird taking the lead then walks around his partner, stepping high like a negro cake-walker. This part of the procedure is usually closed by one or both birds pointing their beaks straight up in the air while rising on their toes, puffing out their breasts and uttering a long-drawn groan. The same thing is repeated many times with slight variations.

The albatrosses are said to begin nesting about the middle of November. The one egg is laid on the ground, and the parent bird draws the sand or earth about her, forming a platter-like nest, in which the young albatross, when hatched, spends the early part of its life; in fact it does not stray far away even after it is able to walk about. I carried one of the youngsters

They walk about each other, stepping high like negro cake-walkers and bowing all the time

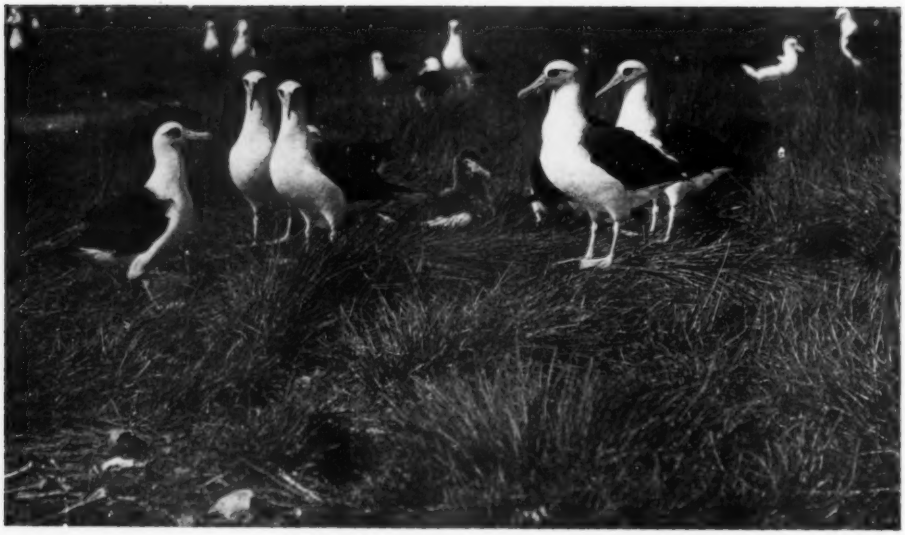
They cross bills rapidly several times. The first stage in the strange "dance" of the Laysan albatross



Second stage in "dance" — One bird quickly turns its head while lifting one wing; the other bird in the meantime snaps its bill

Neighing like a horse. The albatross "dance" is repeated over and over again with slight variations

The final stage in which each bird points its beak straight up in air while rising on its toes, puffing out its breast and uttering a long-drawn groan



Laysan albatrosses are not afraid of man. They approach a visitor on the island as if to greet him, bowing profoundly

Young albatrosses totter along fanning their wings in a futile attempt to fly

Black albatross about to feed young. The food consists of squid partially digested by the parent

to see the youngsters tottering along and fanning their wings in a futile attempt at flight. They play and quarrel with one another and amuse themselves by gathering together any loose material that may be near the nest. One young bird had surrounded itself with a pile of the bleached bones of its dead ancestors.

The black-footed albatross (*Diomedea nigripes*) has taken almost complete possession along the beaches on the north, east and south sides of the island. An occasional pair may be found nesting with the white species, but as a rule they are found by themselves.

The black-footed albatross is somewhat larger than the white species, and when seen on the some distance from its nest to see if it would find its way back; after it had recovered from its fit of anger at being disturbed, it slowly waddled home. During the morning hours, the old birds feed the young, the food consisting entirely of squid that have been partly digested by the parent.

The young albatross was wearing a coat of dark brown down when we landed on the island [about April 24] which gave way a few weeks later to the white feathers on the breast and abdomen and the dark feathers of the back and wings. When the down has nearly disappeared the young bird begins to try its strength by spreading the wings and rising on its feet like the adult birds. It is laughable

Black albatross singing

The black albatrosses occupy the beaches of Laysan. This species also has a "dance," more elaborate than that of the white albatross and at a slower pace. The notes are soft and the dance ends with a sound like the stroke of a bell under water

wing is instantly recognized as being far superior as an aviator. Black albatrosses followed our ship all the way from the Hawaiian Islands to San Francisco. They nest like the white species and feed their young in the same manner. Also they have a performance similar to that of the white species, but much more elaborate and they go through the figures more slowly and gracefully. Instead of lifting one wing they raise both, while the notes uttered are much softer and the whole ends with a sound like the stroke of a bell under water or deep within the bird's body. Black albatrosses are very neighborly with the white species. We often saw them visiting a white colony and on a few occasions trying to perform with them, but the rapid pace set by the white bird was rather too much for his more deliberate cousin, and in each instance the affair ended disastrously.

During the latter part of August, young albatrosses are strong enough to fly and to feed themselves; all then leave the island and live on the sea until their return for the nesting season. It is a satisfaction in these days when all wild life is fast disappearing to know that there is in the middle of the Pacific this bird wilderness quite unmolested by man.

OPENING OF THE HALL OF PUBLIC HEALTH

[Report by the department]

The exhibits of the department of public health which were sent to the International Congress of Hygiene and Demography in Washington last fall, through the generosity of Mr. Felix M. Warburg, dealt with the problems of water supply and waste disposal and with the bacteria. After their return from the Congress, where they were awarded the highest honor in both sections of the exhibit in which they were included, these models were installed in permanent fashion in the west corridor on the third floor. During the past year the department has been at work on the preparation of material bearing on the problems of insect-borne disease; and the completion of half a dozen of these exhibits and in particular of the model described in the daily press as "the house fly[1] as big as a cat" was selected as an auspicious occasion for the formal opening of the new hall of public health. In view of the fact that the movement for cleaning the city inaugurated by Health Commissioner Lederle this spring is largely based upon the danger to health from insect-carriers of disease, it was felt that our exhibition might be made of assistance in this important public work. The friends of the Museum were therefore invited on the evening of Wednesday, April sixteenth, to take part in a public meeting in the interest of the campaign for civic cleanliness instituted by the New York City department of health as well as to assist at the opening of the hall of public health.

The large lecture hall was well filled and on the platform besides Dr. Henry Fairfield Osborn, president of the Museum, and Dr. Frederic A. Lucas, director, the Museum was represented by Dr. Walter B. James and Mr. Felix M. Warburg of the board of trustees. With them sat Dr. Livingstone Farrand, secretary of the American Public Health Association, Mr. H. deB. Parsons of the Metropolitan Sewerage Commission, Dr. C. Ward Crampton, director of physical training of the department of education, Prof. Charles Baskerville of the College of the City of New York and Dr. N. E. Ditman of the American Museum of Safety.

[1] The first step in constructing the model was the study of the fly itself. It was found necessary to make the studies upon living flies stupefied with chloroform, or from freshly killed specimens since within half an hour after death much of the original color of the fly as well as the surface modeling changes. The chitinous armor is distorted either through the contraction of soft parts or the collapse of the air-tubes or tracheæ, while the limbs are drawn up into unnatural positions. Even the color of the eye changes a short time after death. Hence each specimen is useful only for a short time. About two hundred flies were used as models for the preliminary studies and as guides during the work of construction. Careful drawings enlarged to scale were made by Mr. Matausch of all anatomical details and these are on file in the Museum to vouch for the accuracy of the work. The head, mouth parts, body and legs were modeled separately in clay, cast in wax, smoothly finished and polished and accurately colored. The construction of the compound eyes was a problem in itself. Each one contains more than twelve hundred separate little eyes or ocelli. These are so arranged that they stand in perfect rows, when looked at from any one of three directions. In the model each eye is a separate glass bead, accurately placed in its proper position.

The most difficult and trying process was the construction and insertion of the hairs with which the body is covered. Since there are several kinds of hair on the fly varying in size, shape, and direction of insertion, and since these bend in characteristic positions often of importance to the economy of the fly, it was a serious matter to portray them accurately. This was finally accomplished by constructing each hair separately of german silver wire, filing it to its proper shape, bending it according to its peculiar character, and placing it carefully in its proper position. The wings were modeled in celluloid. The halteres (a rudimentary second pair of wings) the plumelike antennæ, the club-shaped palps or tasting organs were all accurately modeled and articulated into position. The fly is mounted on a base representing a magnified rectangular crumb of bread. [*Notes by Mr. R. W. Miner of the department of invertebrate zoölogy.*]

A MODEL OF THE HOUSE FLY

This model, fifteen inches in length and 64,000 times the size of the living fly, is the product of nearly one year's work by Mr. Ignaz Matausch, preparator. It is doubtless the most accurate and adequate representation of the external anatomy of the common house fly (*Musca domestica*) in existence, for not only have the more striking features been faithfully copied, but even the lesser details visible upon a magnification of forty diameters have been modeled with the utmost accuracy

President Osborn presided and spoke as follows:

"This evening we enter into the campaign to clean up the homes of six million people. Has it ever occurred to you that among other inventions, man is the inventor of dirt? In the whole of God's universe, before man defiled it, there was not a speck of dirt; everything was spotlessly clean. Go into the wilds anywhere, into the great deserts or in the great swamps, it is always the same. In the economy of Nature wherever there is a temporary deposit of what might be classed as dirt, like a decaying carcass or a pile of excrement, there is an army of scavengers — either bacteria or beasts of prey — and a complete clean-up in an incredibly short space of time.

In Nature, therefore, we find the prophets and harbingers of Commissioner Lederle, of Commissioner Edwards, of Mrs. Hewitt and others who are marshalling this great movement.

The part the Museum can play is to furnish visual teaching, first, of the perfect way in which Nature does it, and second, of the clumsy way in which man does it. The contrast is really between the work of God and the work of man, and it is certain that in the advance of civilization the more close we get to Nature's laws and example the more civilized we shall be.

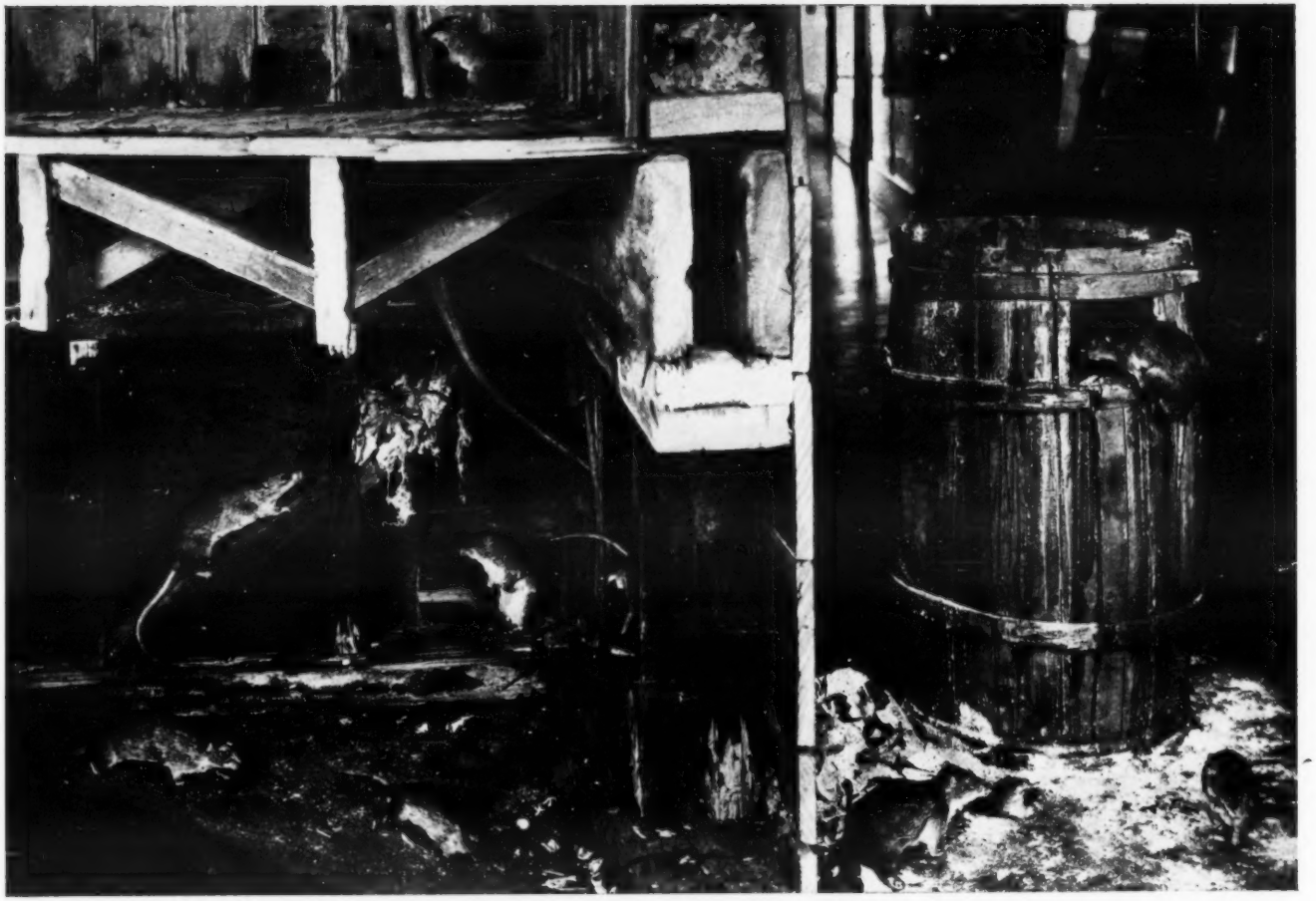
In the hall of public health which opens to the public for the first time this evening, you will find the first attempt made in a pure natural history museum to regard man as after all one of the most important animals.

It is curious how long it takes man to treat his fellow-man as well as he treats his animals. It is true we have societies for the prevention of cruelty to children, child-beating, neglect, but there are more subtle forms of cruelty to children and to grown people as well, which we are just beginning to understand and to guard against. It is cruel to bring a child into the world predestined to disease and suffering, hence eugenics. It is cruel to bring into our country the kind of people who will produce children like this, cruel, I mean, to those already here, hence the survey of immigration. It is cruel to bring up children in an unclean environment, hence this great clean city campaign.

As New York goes, so goes the nation in politics. It is also the case in civics. This great city, which is always decrying itself, and is too large to care for its outside critics, is also the center of the most intense local patriotism and public spirit; and to-night we are to see some of its best manifestations both among those who speak and those who support the movement by their presence here."

Dr. E. J. Lederle, health commissioner of the City of New York, then described the plans for the spring clean-up campaign and showed slides illustrating the bad conditions which exist and the forces of the city available for dealing with them. Mrs. E. R. Hewitt, president of the Woman's Municipal League, in a witty speech, outlined the part which women should play in this and similar movements for civic cleanliness. Dr. C.-E. A. Winslow, curator of the Museum's department of public health, then briefly outlined the viewpoint of the Museum toward this movement, which is in fact a natural history experiment in the adaptation of habitat to the human animal. The following is quoted from his address:

"On this rocky island one of the crucial experiments of civilization is being made, an experiment requiring the unremitting effort and keenest intelligence for its successful conduct. Consider what would happen if the vigilance with which our comfort and safety is here guarded were relaxed for only a few days, how the forces of primitive nature would rush in and take possession. The wolves and bears are gone from Manhattan, but if our water and light failed, if our forces of civic cleanliness and order were paralyzed for a week, destructive hosts of vermin and scourges of plague and pestilence would sweep in. Grass growing in the streets has long been a



A NEW MODEL IN THE DEPARTMENT OF PUBLIC HEALTH

Copied from an original in the possession of the United States Public Health Service of a corner of a kitchen and cellar in California where rats, hosts of the germs of bubonic, had taken almost complete possession of the premises. Another model in the exhibition shows a house and barn protected by approved rat-proof construction

symbol of the desolation of a city and the struggle that is going on in the wake of the western floods to prevent epidemics more fatal than the floods themselves is a fresh reminder that it is no easy task to hold what we have won.

The movement for civic cleanliness in which we have the privilege of taking a small part to-night, is an attempt to make it more certain that the slice of the world's surface that we call New York shall be a place fitted for the higher life of man and not for the lower life of vermin and microbe. Garbage and rubbish in cellars and streets and lots make the city a home for rats and flies. Undrained marshes and stagnant pools of water make it a home for mosquitoes and malarial germs. Improper care of human wastes and foul harbor waters make it a home for the typhoid bacillus. Clouds of irritant dust prepare congenial ground for the germs of tuberculosis and pneumonia. The removal of these things makes the city a home for civilized man.

We of the American Museum are proud that we can do our part in helping forward movements of this sort. The department of public health is one of the smallest departments of this Museum. It occupies about one per cent of the floor space allotted to exhibition halls. Yet in the mind of its curator this small beginning looms large with future possibilities. It is the thin point at which all the departments of the Museum touch the practical daily life of man. With the advice of the department of geology we have prepared maps and diagrams showing the relations of rainfall and rock formations to public water supply. A preparator skilled in the service of the department of mammalogy has made for us a group of rats which are important as the carriers of bubonic plague. Through generous expenditure of time and energy on the part of the department of invertebrate zoölogy we have been able to prepare models of the microörganisms of lakes and reservoirs and of some of the insects which carry disease.

It happens that the new exhibits for the first time formally displayed to-night deal with this last problem of insect-borne disease and are therefore particularly germane to the objects of Dr. Lederle's city cleaning movement. The models of the mosquito in the Darwin hall have for many years testified to the interest of the Museum in these practical problems of human welfare. The new material deals particularly with two other insect-carriers, the flea and the fly, and marks the beginning of a somewhat extensive plan for a comprehensive exhibit of insects in relation to disease. We have now installed a striking model copied from an original in the possession of the U. S. Public Health Service of a corner of a kitchen and cellar in California where rats, the hosts of the germ of plague, had taken almost complete possession of the premises; and as a companion we have a small model of a house and barn protected against vermin by approved rat-proof construction. We have small models showing how an ill-kept farm threatens the health by polluted water and the breeding of flies and mosquitoes and how all these conditions are remedied on a well-kept farm. We have a model showing how much more fatal were typhoid germs than bullets in the Spanish war of 1898. Finally we have an enlarged model of the house fly itself, one foot long, upon which the patience and study and artistic skill of Mr. I. Matausch have been constantly employed for over nine months."

After the speaking a remarkable moving picture film was shown illustrating the life history and habits of the fly. This was kindly loaned for the occasion by Mr. Edward Hatch, Jr., chairman of the Fly-fighting Committee of the Merchant's Association.

The exhibits so far installed include only the beginning of the contemplated section dealing with the relation between insects and disease and the department of public health plans to continue during the coming summer the preparation of exhibits dealing in particular with the fly.

MUSEUM NOTES

SINCE the last issue of the JOURNAL the following persons have been elected to membership in the Museum:

Patron, HON. CHARLES SMETS;

Sustaining Member, MR. H. C. FAHNESTOCK;

Life Members, MRS. WILLIAM G. NICHOLS, MRS. M. ROBERTSON, MRS. WILLIAM SLOANE; HIS EXCELLENCY, J. MALFEYT, and MESSRS. ALBERT H. BALDWIN, ALFRED DEJONGE, and GEORGE EASTMAN;

Annual Members, MRS. A. J. BLOOMBERG, MRS. J. B. EDSON, MRS. AUGUST LEWIS, MRS. JULIUS LOEWENTHAL, MRS. EUGENE MEYER, JR., MRS. JAMES E. POPE, MRS. OSCAR ROSENTHAL, MRS. EMILY M. SCOTT, MRS. THEODORE THOMAS, MISS EVA R. INGERSOLL BROWN, DR. HARRY R. SALOMON, PROF. EDMUND B. WILSON and MESSRS. GEORGE B. BERNHEIM, HENRY S. BRILL, WILLIAM W. COHEN, NICHOLAS EVERTSON CROSBY, HENRY DUCHARDT, NATHAN FLEISCHER, HERBERT FRANKEL, HENRY E. FRANKENBERG, CHARLES A. GOULD, JOHN M. W. HICKS, JONAS LIE, HUGO V. LOEWI, CHARLES L. LOOP, CHARLES W. MCCUTCHEN, FRED. A. MACK, EDWARD F. MCMANUS, FRANK H. MAIN, JOHN PALMER, P. STUYVESANT PILLOT, FRED. L. REIS, MYRON W. ROBINSON, C. P. SCHLICKE, WALTER SCOTT, GERALD SHERMAN, EUGENE E. SPIEGELBERG, DUNCAN STERLING, JOSEPH TATE and R. B. VAN DYKE.

MR. JOHN BORDEN of Chicago, who is planning a hunting trip in the Arctic for big game and has built for the purpose an especially designed schooner yacht, will endeavor to secure for the Museum the skeleton of a bowhead whale. With this in view, he has invited Mr. Roy C. Andrews of the Museum to accompany him upon the cruise. The party will leave San Francisco about the first of July upon the yacht which is now on her way around the Horn. Besides making especial efforts to kill a bowhead whale, the members of the party will spend considerable time in hunting brown and polar bear, walrus and caribou. The whale if secured will be towed to the nearest harbor and Mr. Andrews will be landed to prepare the skeleton, which will be sent to Seattle by coasting schooner for shipment to New York. Mr. Borden's yacht carries a fully equipped New Bedford whaleboat, and is captained by Mr. Charles Sparks, an experienced whaleman from Provincetown.

The Museum is especially to be congratulated upon the opportunity which Mr. Borden has presented to acquire the skeleton of this whale. Because of the great expense attendant upon securing a specimen, since this species has a high commercial value, its acquisition had seemed impossible. This one species alone is needed to complete the Museum's collection of large cetaceans. There are at present no bowhead skeletons in America and but little scientific data is known as to the external anatomy. Through Mr. Borden's generosity moreover it may be possible to exhibit in the proposed new whale hall of the Museum not only the complete skeleton, but also a life-size model of this remarkable animal.

DURING the month of May there will be on exhibition in the west assembly hall and adjoining corridor a series of paintings of Alaskan scenes by Leonard M. Davis, some of the results of many years' residence in Alaska. The series comprises more than a score of large canvases and about one hundred small studies — snow-clad mountains, gorgeous sunsets, brilliant auroras, flower-clad hillsides, displaying the wealth of color that makes the northland a continual surprise to those who think of it as always bleak.

THE State of Arkansas has long been noted for the unusually fine class of stone implements found in the mounds and ancient village sites occurring in that region.

The Museum has been fortunate enough to receive through Mr. Joseph M. Bell a fine example of the best class of stone work plowed out in a field one-half mile east of Bassett, Mississippi County, Arkansas. The implement is one of the so-called ceremonial celts and has received a very high polish. It is an unusual form, the use of which is problematic.

THROUGH the bequest of the late Edward Russ, a life member, the Museum has received one thousand dollars.

THE MUSEUM is designated as one of ten residuary legatees under the will of the late Morris Loeb. According to the terms of the bequest it must be used for the illustration of the industrial use of natural products in ancient and modern times.

MISS MARY CYNTHIA DICKERSON has been promoted from assistant curator to associate curator in the department of ichthyology and herpetology, this appointment taking effect May 1, 1913.

THE material collected by the third African expedition, under Dr. W. S. Rainsford, has been received at the Museum. It contains specimens of black rhinoceros, East African buffalo, eland, leopard, cheetah, antelope and monkey.

PROFESSOR T. T. WATERMAN, assistant professor of anthropology in the University of California will spend the summer in New York, in part to study the collections in the American Museum.

THE MUSEUM series of cave paintings has been extended by a series from the caves of South Africa. On the end wall of the African hall are four panels presenting the best known examples of Bushmen art. These are not of great antiquity but seem to belong to a state of culture somewhat analogous to that of the cave men of Europe. The most interesting panel is that representing a running fight between a party of Bushmen cattle thieves and a pursuing posse of Kaffirs.

MR. MAX SCHRABISCH has brought his rock-shelter collections and reports to the Museum for the season of 1912–13. Seven sites were explored. The most important was one near Stony Point, New York. This proved to be a large granite boulder under the shelter of which the Indians camped. The ancient fireplaces were uncovered and several refuse pits filled with bones of the animals used for food.

MR. A. J. MUTCHLER has been appointed assistant in the department of invertebrate zoölogy, this appointment taking effect May 1, 1913.

THE collection of local birds is once more open to the public after having been retired for some months on account of its removal to new quarters and the installation of the exhibits of the department of public health on the third floor. The local birds may now be found in the west corridor, second floor.

THE California gray whale (*Rhachianectes glaucus*) which Mr. Roy C. Andrews secured on his last cruise was the subject of an interesting communication by him to the May meeting of the Section of Biology, New York Academy of Sciences. He showed that in many points of its skeleton *Rhachianectes* is the most primitive living whalebone whale and that it is probably the little-changed descendant of the early

Tertiary ancestral stock which also gave rise both to the Balænopteridæ (fin whales) and to the Balænidæ (right whales).

THE department of ichthyology and herpetology has just received through exchange from the Queensland Museum, Brisbane, Australia, an interesting series of specimens of fishes and reptiles from the Australian region.

AT Rancho La Brea near Los Angeles, California, is a series of ancient asphalt pools covering many acres, which contain thousands of skeletons of a great variety of extinct animals of the Pleistocene epoch. Ground sloths, sabre-tooths, extinct species of wolves and many other animals are heaped together in amazing profusion. To the Section of Biology, New York Academy of Sciences, Dr. Matthew recently described his visit to Rancho La Brea, touching especially on its probable origin, and on the way in which the remains of the entrapped animals had been dissociated and intermingled. He also exhibited some of the fossils from this formation which had been secured in exchange from the University of California through the coöperation of Professor J. C. Merriam.

THE cover of this number of the JOURNAL is designed from objects of antiquity and historic value in the Morgan gem collection. Babylonian cylinders dating from 4000 to 400 B. C. are combined in the border, an enlargement of a portion of a fifteenth century turquoise inscribed with two thousand words of the Koran forms the inner band, and an agate axhammer of ancient workmanship occupies the lower left-hand corner. The cylinders are engraved with figures and names on various minerals such as lapis-lazuli, jasper, chalcedony, steatite, hematite and agate. The axhammer of banded agate was in the possession of Cardinal Borgia while at the head of the Propoganda, was acquired from the Countess Ettore Borgia by Count Michael Tyskiewiez for 15,000 francs ($3000) and purchased by Tiffany and Company soon after his death. It found its way into the Museum's gem collection through the generosity of Mr. Morgan.

THE Berlin Museum has for some years past conducted explorations in the dinosaur beds of German East Africa. These explorations, financed upon a far more liberal scale than those of American museums, have secured splendid collections of dinosaurs from that region. While the preparation and study of these collections will doubtless take some time to complete, the preliminary reports which have been published indicate that they will equal or surpass anything that has been found in this country. The largest of these East African dinosaurs, distinguished by an extraordinary length of neck and fore limb, is probably related to the imperfectly known *Brachiosaurus* of this country and much exceeds the *Brontosaurus* or *Diplodocus* in the size of these parts. With this were found partial or nearly complete skeletons of numerous smaller dinosaurs, and various other remains. Three successive faunæ have been distinguished by the German geologists, and it is hoped that much may be learned as to the evolution of these extraordinary reptiles.

The total cost of the expedition is stated at 180,000 marks ($45,000) up to 1912, most of which was raised by private subscription. An additional sum of 50,000 marks has since been voted by the Prussian government. This liberal support attests the widespread interest in scientific progress displayed by the German people and in particular their interest in these records of the past history of the world. Yet as Dr. Edward Hennig, from whose description [*Am Tendaguru*, Schweizerbart'sche Verlagsbuchhandlung: Stuttgart, 1912] the above facts are mainly taken, remarks, the amount is small in comparison with the cost of say the German Antarctic expedition for which 1,500,000 marks were subscribed.

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